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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,361	07/23/2003	Peter Michael Edic	120520-2/YOD GERD:0051	8219
7590	07/05/2006		EXAMINER SONG, HOON K	
Patrick S. Yoder FLETCHER YODER P.O. Box 692289 Houston, TX 77269-2289			ART UNIT 2882	PAPER NUMBER

DATE MAILED: 07/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/625,361		EDIC ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Hoon Song		2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-21, 25-36 and 42-55 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-6, 22, 23, 37, 38, 40 and 41 is/are rejected.
- 7) ☒ Claim(s) 3, 24 and 39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4, 22-23 and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seppi et al. (US 4182311) in view of Stergiopoulos et al. (US 6535570B2).

Regarding claims 1, 22 and 37, Seppi teaches a method or CT apparatus comprising:

a gantry with an x-ray source (50) and detector (56);

a computer system (110) configured to acquire a projection data set during one or more slow rotations (figure 4) of a CT gantry (101) about a dynamic object (112).

However Seppi fails to teach a computer system configured to:

determining one or more motion data sets representing the motion of the dynamic object over time from the projection data set or from two or more images reconstructed from the projection data set; and

reconstructing one or more motion-corrected image of the dynamic object using the one or more motion data set.

Stergiopoulos teaches a CT method or system comprising:

determining one or more motion data sets representing the motion of the dynamic object over time from the projection data set or from two or more images reconstructed from the projection data set (column 6 line 38-40); and

reconstructing one or more motion-corrected image of the dynamic object using the one or more motion data set (column 6 line 41-58).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the CT image reconstruction of Seppi with the motion correct CT reconstruction as taught by Stergiopoulos, since it would reduce motion artifacts in a image without major hardware modification (column 2 line 27-36).

Regarding claims 2, 23 and 38, Seppi teaches the dynamic object is a heart (figure 2).

Regarding claim 4, Seppi teaches the projection data set is acquired during one slow rotation of the CT gantry (figure 4).

Claims 5-6 and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seppi as modified by Stergiopoulos further in view of Stonestrom (US 4284896).

Regarding claims 5-6 and 40-41, Seppi fails to teach the one or more slow rotations or the partial rotation take approximately fifteen seconds per rotation.

Stonestrom teaches a gantry rotation speed of fifteen second (column 2 line 42).

It would have been obvious to one of ordinary skill in the art at the time of the invention to rotate the CT system of Seppi with at the rotation speed as taught by Stonestrom, since the rotation speed would reduce mechanical constraint of fast gantry rotation while providing sufficient time to collect imaging data for reconstruction data acquisition.

***Allowable Subject Matter***

Claims 7-21, 25-36 and 42-55 are allowed over prior art.

Claims 3, 24 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 3, 24 and 39, the prior art fails to teach reconstructing the one or more motion corrected images comprises warping a reconstruction grid at a view angle in accordance with the motion data set for the view angle and back-projecting the projections corresponding to the view angle onto the warped reconstruction grid as claimed in dependent claim 3.

Regarding claims 7-21 and 25-36, the prior art fails to teach a method or a computer program provided on one or more computer readable media for reducing motion-related artifacts in a CT cardiac image by acquiring a projection data set during one or more slow rotations or a slow partial rotation of a CT gantry about a heart, warping one or more reconstruction grids based upon data determined cardiac motion,

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wherein each reconstruction grid is associated with a view angle and back-projecting a corresponding projection onto a respective warped reconstruction grid for all view angles to generate a motion corrected image, wherein the corresponding projection comprises the projection acquired at the respective view angle associated with the warped reconstruction grid as claimed in independent claims 7 and 25.

Regarding claims 42-55, the prior art fails to teach a CT system having a system controller configured to control an x-ray source and to acquire a set of projection data during one or more slow rotations or a partial rotation of the x-ray source about a heart from one or more of detector elements and a computer system configured to warp one or more reconstruction grids based upon determined cardiac motion, wherein each reconstruction grid is associated with a view angle, and to back projects a corresponding projection onto a respective warped reconstruction grid for all view angles to generate a motion corrected image, wherein the corresponding projection comprises the projection acquired at the respective view angle associated with the warped reconstruction grid as claimed in independent claims 42.

### ***Response to Arguments***

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is (571) 272-2494. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

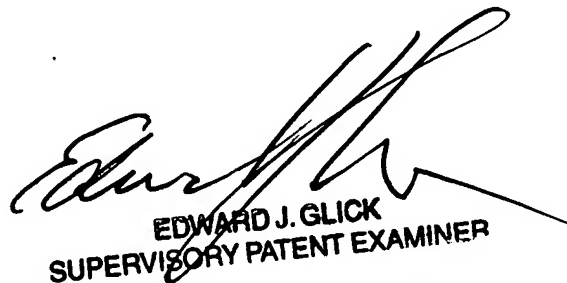
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272 - 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HKS

6/21/06  
HKS



EDWARD J. GLICK  
SUPERVISORY PATENT EXAMINER